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Preparation and Pharmacokinetic Studies of Mucoadhesive Oral Multiple Unit Systems of Metronidazole

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***SUMMARY*. The objective of the present study was to investigate the applicability of matrix type chitosan treated alginate multiple unit systems (MUS) for sustained release of metronidazole prepared by ionotropic gelation method. Spherical MUS with 0.64 ± 0.95 to 0.75 ± 0.38 mm length and 0.63 ± 0.34 to 0.74 ± 0.28 mm breadth and 71.60 ± 0.42 to 82.15 ± 0.35 % entrapment efficiency were produced. The fluoroscopic study reveals that the MUS was retained in gastrointestinal tract (GIT) for more than 5 h and found to be distributed throughout the GIT. The *in vivo* evaluation in healthy human volunteers of the MUS and that of Flagyl® IR tablets each containing 400 mg drug revealed that the MUS showed improved pharmacokinetic parameters to Flagyl® producing a significantly different ($p < 0.05$) AUC. This study demonstrates that the MUS could be a good alternative to immediate release tablets to deliver metronidazole and expected to be less irritant to gastric and intestinal mucosa.**

KEY WORDS: Bioavailability studies, Chitosan, Gastrointestinal transit, X-ray.

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